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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/874,365	06/06/2001	Thomas D. Kudrle	CRF D-2688	2949

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EXAMINER

CATHEY, DAMIAN E

ART UNIT

PAPER NUMBER

2817

DATE MAILED: 06/26/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/874,365

Applicant(s)

KUDRLE ET AL.

Examiner

Damian E. Cathey

Art Unit

2817

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☒ Claim(s) 7 is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 June 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Drawings

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the comb-drive microactuator recited in claim 7 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Objections

Claim 7 is objected to because of the following informalities: Claim 7 recites, "said microactuator is a comb-drive type actuator", which the examiner suggests should be changed to --comb-drive actuator-- because "type" could cause confusion (See MPEP 2173.05(c) E). Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 3 and 4 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Regarding claim 3, the phrase, "first and second end sections" is recited, but it is unclear as to the first and second end sections of what is being described, thereby rendering the claim vague and indefinite.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily

published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

Claims 1 and 3-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Nguyen et al. U.S. Patent No. 5,839,062.

Referring to claim 1, Nguyen et al. disclose (Figs. 8A-8C) a transmission line structure having a substrate, 88 (See Fig. 4A), first and second spaced parallel conductive beams, 76 and 78 (See Fig. 4A), being spaced laterally from one another by a selected distance, an actuator, Vc and Vp, (which inherently function to actuate the conductive beams, 76 and 78 See Nguyen et al. Col. 6, line 18) for moving the conductive beams, 76 and 78 laterally to reduce the distance between the beams and thereby alter the electrical characteristics of the transmission line structure, 46 (See Nguyen Col. 6, line 18).

In reference to claim 3, Nguyen et al. disclose (Figs. 8A-8C) a transmission line structure including a "matching section", 104, disposed between first and second end sections of the conductive beams (assuming that the "first and second end sections" noted in the 112, 2nd rejection above refers to the conductive beams), 76 and 78 (See Fig. 4A), being disposed at an angle relative to first and second end sections (See Nguyen et al. – Claim 1), and the actuator serves to vary the capacitance of the first and second end sections (See Nguyen et al. Col. 8, lines 20-24 and Col. 5, line 15), and the transmission line structure acts as a phase shifter (See Nguyen – Claim 1).

Referring to claim 4, Nguyen et al. disclose (Figs. 8A – 8C) a matching section, 104, disposed at a right angle relative to the first and second end sections, 76 and 78.

Referring to claim 5, Nguyen et al. disclose (Fig. 8A-8C) a transmission line structure wherein the first and second conductive beams, 76 and 78 (See Fig. 4A), are suspended above the substrate, 88 (See Fig. 4A), by a plurality of anchors (See Nguyen et al. Fig. 4A and Col. 4, line 67 – Col. 5, line 1) disposed on the substrate, 88.

In reference to claim 6, Nguyen et al. disclose (Figs. 8A – 8C) an actuator, which inherently functions as a microactuator.

Referring to claim 7, Nguyen et al. disclose (Figs. 8B - 8C) that the actuator is a comb-drive type actuator (See Nguyen et al. Col. 5, line 3).

In reference to claim 8, Nguyen et al. disclose (Figs. 8B and 8C) a first actuator, Vc/Vp1, for moving the first beam, 80, and a second actuator, Vp2, for moving the second beam 80'.

Referring to claim 9, Nguyen et al. disclose a transmission line structure (Figs. 8A – 8C) wherein the first beam, 76, and the second beam, 78, are laterally movable by an actuator into engagement with one another, and the transmission line inherently acts as a switch.

Claims 1, 6, and 9 are rejected under 35 U.S.C. 102(e) as being anticipated by Wang et al. U.S. Patent No. 6,020,564.

Referring to claim 1, Wang et al. disclose (Fig. 11) a transmission line structure having a substrate, 103, first and second spaced parallel conductive beams, 116, being spaced laterally from one another by a selected distance, an actuator, 131, for moving the conductive beam, 116, laterally to reduce the distance between the beams and thereby alter the electrical characteristics of the transmission line structure.

In reference to claim 6, the actuator of Wang et al. inherently functions as a microactuator because it is being used with microelectromechanical technology.

Referring to claim 9, Wang et al. disclose (Fig. 1B) a transmission line structure wherein first and second beams, 116, are laterally movable by an actuator, 131, into engagement with one another, whereby the structure acts as a switch.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nguyen et al. U.S. Patent No. 5,839,062 in view of Suzuki U.S. Patent No. 6,265,806.

Referring to claim 2, Nguyen et al. are silent as to the material used to form the first and second conductive beams, 76 and 78.

Claim 2 states that the first and second conductive beams are formed from single-crystal silicon having a conductive metal layer formed thereon.

Suzuki discloses (Fig. 4) a microactuator having stationary comb-tooth shaped electrodes, 3 and 33, and movable comb-tooth shaped electrodes, 4 and 34, formed of single crystal silicon with a conductive metal formed thereon (See Suzuki Col. 10, line 2)

Suzuki further discloses that single crystal silicon is used in order to achieve a desired thickness (See Suzuki Col. 3, line 4)

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have further modified the device of Nguyen et al. and formed the comb-tooth shaped electrodes from single crystal silicon having a conductive metal formed thereon, as taught by Suzuki.

The above modification would have been considered obvious as a substitution of art-recognized equivalent materials because since Nguyen et al. are silent as to what material is used to form the comb-tooth shaped electrodes, any art-recognized equivalent material would be usable, thereby suggesting the obviousness of the modification.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent No. 6,180,428 to Peeters et al. is cited with respect to the state of the art of comb-driven actuators and fabrication of the actuators using silicon.

U.S. Patent Application Publication No. 2001/0038254 to Dhuler is cited with respect to the state of the art of actuators and fabrication of actuators using single crystalline silicon material.

U.S. Patent No. 5,025,346 to Tang et al. is cited with respect to the state of the art of laterally driven resonant microstructures.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Damian E. Cathey whose telephone number is 703-305-1631. The examiner can normally be reached on 7:00 - 3:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bob Pascal can be reached on 703-308-4909. The fax phone numbers for the organization where this application or proceeding is assigned are 703-746-7266 for regular communications and 703-305-0142 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.


Justin P. Bettendorf
Primary Examiner
Art Unit 2817